Amendments to the claims

1 – 20. (Canceled)

21. (Previously presented) Previously presented) An apparatus for depositing a magnetic film, comprising:

a sputtering chamber containing a target comprising a magnetic sputtering material and a substrate support having a substrate surface that is separated from the target; and

an annular magnet array disposed within the sputtering chamber, the annular magnet array being configured to form at the substrate surface of the substrate support a magnetic field that is substantially parallel to and extends along the substrate surface of the substrate support and is flatter and more parallel to the substrate surface at a first position adjacent to the substrate surface than at a second position similarly adjacent to the target, the annular magnet array being concentrically positioned around an outer perimeter of the substrate surface of the substrate support.

22. (Previously presented) The apparatus of claim 21, wherein the target comprises a material that retains magnetic properties when deposited on the surface of a substrate.

23. (Previously presented) The apparatus of claim 21, wherein the target is separated from the substrate support by a distance of at least 50 mm.

24. (Previously presented) The apparatus of claim 21, wherein the annular magnet array comprises a plurality of magnetic segments positioned in an annular configuration around the perimeter of the substrate support, the plurality of magnetic segments having different magnetic orientations that cooperatively to form the magnetic field that is parallel to the substrate surface.

25. (Previously presented) The apparatus of claim 23, wherein the target comprises a nickel/iron alloy.

26. (Previously presented) The apparatus of claim 21 wherein the target and the substrate supporting surface are separated by a distance of at least 50 mm.

27. (Previously presented) A method for depositing a magnetic film within a sputtering chamber containing a target and a substrate, comprising:

sputtering the target onto a surface of the substrate at a pressure less than about 15 mTorr; and

generating at the surface of the substrate a static magnetic field that is substantially parallel to and extends along the surface of the substrate during sputtering using a stationary annular magnet array concentrically disposed around a perimeter of the surface of the substrate within the sputtering chamber, wherein the magnetic field is more parallel to the substrate surface at a position closer to the substrate than to the target.

28. (Previously presented) The method of claim 27, wherein the sputtering occurs at a chamber pressure less than about 5 mTorr.

29. (Previously presented) The method of claim 27, wherein the target and the surface of the substrate are maintained at a distance of at least 50 mm during sputtering.

30. (Previously presented) The method of claim 29, wherein the target comprises a Ni/Fe alloy.

31. (Previously presented) A method for depositing a magnetic film within a sputtering chamber containing a target and a substrate, comprising:

sputtering the target onto a surface of the substrate at a pressure less than about 15 mTorr;

collimating sputtering of the target with a grounded collimator disposed between the target and the substrate;

generating at the surface of the substrate a static magnetic field that is substantially parallel to the surface of the substrate during sputtering using a stationary annular magnet array disposed around a perimeter of the surface of the substrate within the sputtering chamber, wherein the magnetic field is flatter at a first position adjacent to the substrate surface than at a second position similarly adjacent to the target;

generating a target magnetic field from a magnetron positioned in back of said target with respect to substrate; and

wherein the grounded collimator removes charges from target particles and reduces interference between the target magnetic field and the static magnetic field which is substantially parallel to the surface of the substrate.

32. (Previously presented) The apparatus of claim 21, wherein said magnetic field at said substrate surface is substantially parallel to said substrate surface.

33. (Previously presented) The apparatus of claim 21, wherein said annular magnet array comprises a plurality of permanent magnets.

34. (Previously presented) The apparatus of claim 33, wherein said plurality of permanent magnets are magnetized parallel to a plane of said substrate surface

35. (Previously presented) The apparatus of claim 21, wherein said annular magnet array is a Halbach array.

36. (Previously presented) The method of claim 27 wherein said target comprises a material that is magnetic when sputter deposited in a substantially parallel magnetic field.

37. (Previously presented) The method of claim 27, wherein said annular magnet array comprises an array of permanent magnets magnetized parallel to a plane of the surface of the substrate during sputtering.

38. (Previously presented) The method of claim 27, wherein said annular magnet array comprises a Halbach array.

39. (Previously presented) The method of claim 27, wherein said magnetic field at the surface of the substrate is substantially parallel to the surface of said substrate.

40. (Previously presented) The method of claim 27, wherein the substrate is processed to form a magnetic recording head.

41. (Previously presented) An apparatus for depositing a magnetic film, comprising:

a sputtering chamber configured to receive a sputtering target for sputter depositing a magnetically alignable material onto a substrate supported on a support surface in opposition to said target along an axial direction; and

a stationary annular array of permanent magnets surrounding an outer periphery of said support surface and continuously extending from one side to the other side of said support surface parallel to said central axis and creating at a region closer to the support surface than to the target a magnetic field extending horizontally along and parallel to said support surface.

42. (Previously presented) The apparatus of claim 41, wherein said array is a Halbach array.

43. (Previously presented) The apparatus of claim 41, further comprising a grounded collimator positioned between said target and said support surface.

44. (Previously presented) The apparatus of claim 41, wherein said material comprises nickel and iron.

45. (Previously presented) The apparatus of claim 21, wherein said annular magnet array is stationary and produces a static magnetic field.

46. (Previously presented) The apparatus of claim 21, further comprising a magnetron disposed on a side of said target opposite said substrate surface of said substrate support.

47. (Previously presented) The method of claim 27, further comprising generating a target magnetic field adjacent said target from a magnetron positioned in back of said target with respect to said substrate.

48. (Previously presented) A method for depositing a magnetic film within a sputtering chamber containing a target and a substrate support for supporting a circular substrate to be deposited with said magnetic film, comprising:

sputtering the target onto a surface of the substrate; and

generating at a surface of the substrate a static magnetic field that is substantially parallel to and extends along the surface of the substrate during sputtering using a stationary annular magnet array concentrically disposed around a perimeter of the surface of the substrate within the sputtering chamber, wherein the magnetic field is flatter adjacent to the surface of the substrate than adjacent to the target.

49. (Previously presented) The method of claim 48, further comprising collimating

sputtering of the target with a grounded collimator disposed between the target and the substrate.

50. (Previously presented) The method of claim 48, further comprising generating a target magnetic field from a magnetron positioned in back of said target with respect to said substrate support.

51 – 53. (Not entered)

54. (Previously presented) The apparatus of claim 48, wherein said substantially parallel static magnetic field extends along said surface of said substrate.

55. (Previously presented) The apparatus of claim 41, further comprising a magnetron disposed on a side of said target opposite said support surface.

56. (Previously presented) The method of claim 27, further comprising collimating sputtering of the target with a grounded collimator disposed between the target and the substrate.

57. (Previously presented) The apparatus of claim 21, wherein said sputtering chamber further comprises a grounded collimator positioned between the target and the substrate support.

58. (New) The apparatus of claim 21, wherein the substrate surface is circular for supporting a single circular substrate.

59. (New) The method of claim 27, wherein the surface of the substrate is circular and the annular magnet array is disposed around only a single substrate.

60. (New) The method of claim 31, wherein the annular magnet array is disposed around

a perimeter of only one substrate.

61. (New) The method of claim 41, wherein the substrate is circular and the support surface is circular and configured for supporting single substrate.

62. (New) The method of claim 48, wherein the substrate support is circular and configured for supporting a single substrate.